IR-2311 (2-3643) (V7942)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS AND INTERFERENCES

In re Patent Application of:	Confirmation No.: 7190
Frank Athari	Date: May 20, 2008
Serial No.: 10/650,246	Group Art Unit: 2836
Filed: August 28, 2003	Examiner: Michael Rutland Wallis

For: ACTIVE EMI FILTER FOR POWER SUPPLY OUTPUT

VIA EFS-WEB
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPEAL BRIEF PURSUANT TO 37 C.F.R. §41.37

Sir:

This Appeal Brief concerns the propriety of the Examiner's final rejection mailed December 21, 2007 in connection with the above-identified patent application. In support of the Notice of Appeal filed on March 20, 2008, the following Appeal Brief is presented.

REAL PARTY IN INTEREST:

The real party in interest in the above-identified application is International Rectifier Corporation.

RELATED APPEALS AND INTERFERENCES:

The applicant, the assignee and the undersigned attorneys are not aware of any related appeals and interferences.

STATUS OF CLAIMS:

Claims 2-13 are pending. Claims 2-13 are rejected and are involved in the instant appeal. Claim 1 has been canceled.

Claim 1 has been amended in an Amendment filed March 24, 2006 in response to a non-final Office Action dated December 27, 2005.

An Amendment has been filed August 22, 2006 in response to a non-final Office Action dated May 23, 2006. No amendments to the claims have been made.

Claim 1 has been canceled and claims 2, 3, 6-9 have been amended in an Amendment filed November 27, 2006 in response to a non-final Office Action dated November 8, 2006.

Claims 3 and 8 have been amended and new claims 10-13 have been added in an Amendment filed April 25, 2007 in response to a non-final Office Action dated January 26, 2007.

Claim 11 has been amended in an Amendment filed August 14, 2007 in a response to a final Office Action dated June 4, 2007. In the final Office Action, claims 2-6 and 8-13 have been rejected under 35 U.S.C. §102(a) as being anticipated by U.S. Patent No. 6,636,107 to Pelly ("Pelly"). Further, claims 2 and 7 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Pelly in view of U.S. Patent No. 5,668,464 to Krein et al. ("Krein").

A Notice of Appeal and a Supplemental Amendment have been filed on September 4, 2007 in response to an Advisory Action dated August 22, 2007. Claim 11 has been amended. The Advisory Action indicated that the request for reconsideration has been considered but does not place the application in condition for allowance because the proposed amendments to claim 11 fail to correct the objected to language. The amendments to claim 11 have not been entered.

An Advisory Action has been mailed September 19, 2007 in response to the Supplemental Amendment filed September 4, 2007. The Advisory Action indicated that the proposed amendments to claim 11 have been entered but the rejections to claims 2-13 remained.

An Appeal Brief Under 37 C.F.R. §41.37 in support of the Notice of Appeal and Supplemental Amendment filed on September 4, 2007 was filed on October 31, 2007.

A final Office Action has been mailed December 21, 2007 in response to the Appeal Brief filed October 31, 2007. In the final Office Action, claims 2-13 have been rejected. Claims 3-6 and 8-13 have been rejected under 35 U.S.C. §103(a) as being anticipated by U.S. Patent No. 6,636,107 to Pelly ("Pelly '107") in view of U.S. Patent No. 6,700,806 to Kolar ("Kolar"). Claims 7-8 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,690,230 to Pelly ("Pelly '230") in view of U.S. Patent No. 5,731,689 to Sato ("Sato"). Claim 2 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Pelly '230 in view

of Sato in further view of U.S. Patent No. 6,067,243 to Suzuki et al. Claim 2 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Pelly '107 in view of Kolar in further view of U.S. Patent No. 5,668,464 to Ohkawa et al. ("Ohkawa").

A Notice of Appeal has been filed on March 20, 2008 in response to the final Office Action dated December 21, 2007.

STATUS OF AMENDMENTS:

An Amendment in response to a non-final Office Action dated December 27, 2005 has been filed on March 24, 2006. An Amendment in response to a non-final Office Action dated May 23, 2006 has been filed on August 22, 2006. An Amendment in response to a non-final Office Action dated November 8, 2006 has been filed November 27, 2006. An Amendment in response to a non-final Office Action dated January 26, 2007 has been filed on April 25, 2007. An Amendment in response to a final Office Action dated June 4, 2007 has been filed on August 14, 2007. An Advisory Action dated August 22, 2007 indicated that the request for reconsideration has been considered but does not place the application in condition for allowance because the proposed amendments to claim 11 fails to correct the objected language. The amendments to claim 11 have not been entered. A Notice of Appeal and Supplemental Amendment in response to a final Office Action dated June 4, 2007 and Advisory Action dated August 22, 2007 have been filed September 4, 2007. An Advisory Action dated September 19, 2007 indicated that the proposed amendments to claim 11 have been entered but the rejections to claims 2-13 remained. An Appeal Brief Under 37 C.F.R. §41.37 in support of the Notice of Appeal and Supplemental Amendment filed on September 4, 2007 was filed on October 31, 2007. A final Office Action dated December 21, 2007, in response to the Appeal Brief filed October 31, 2007, indicated that claims 2-13 remain rejected. A Notice of Appeal in response to the final Office Action dated December 21, 2007has been filed on March 20, 2008.

SUMMARY OF CLAIMED SUBJECT MATTER:

CLAIM 8

In accordance with claim 8 a circuit arrangement, an example of which is illustrated in Figures 1 and 2 and discussed at page 3, last paragraph, comprises a power transistor switching stage (see Figure 1 output stage of Power Supply) providing an output voltage and an active EMI

filter having first and second input terminals (A and B) and first and second output terminals (OUT 1/ OUT 2) and a ground return line connected to a ground return line terminal (GND), the input terminals (A and B) of the active EMI filter being connected to receive the output voltage of the power transistor switching stage and the output terminals (OUT 1/ OUT 2) of the active EMI filter providing a filtered output voltage, (see Figure 1 and page 4, lines 1-4) wherein the power transistor switching stage is a switch mode power supply (see claim 8 as filed) and the active EMI filter cancels common mode current that flows between the input terminals and the output terminals, (page 4, line 3 and line 11) substantially eliminating any current due to the common mode current in the ground return line connected to the ground return line terminal.

CLAIM 2

In accordance with claim 2, which depends from claim 8, the power transistor switching stage (Q1/Q2) comprises an output stage, an example of which is illustrated in Figure 1 and discussed at page 3, lines 13-15, comprising an inductor (L) and a capacitor (C) with the output voltage provided across the capacitor (C).

CLAIM 3

In accordance with claim 3, which depends from claim 8, the active EMI filter comprises an amplifier stage having two transistors (Q1 and Q2) each controlled by a current sensor (CT3 and CT4) (see page 4, lines 15-16), the current sensor sensing (claim 3 as filed) the presence of a common mode current to a load connected to the active EMI filter, each of said two transistors (Q1 and Q2) having a first terminal coupled at a common connection to an isolating capacitor (C1) coupled to a ground line (see page 2, lines 6-10 and Figure 2), the isolating capacitor (C1) passing a current to cancel the common mode current in said ground line, each of said two transistors (Q1 and Q2) further having a second terminal coupled to a control terminal via a secondary winding (CT3 and CT4) (see Figure 2).

CLAIM 4

In accordance with claim 4, which depends from claim 3, the two transistors (Q1 and Q2) are complementary (see page 4, line 24).

CLAIM 5

In accordance with claim 5, which depends from claim 3, the ground line connects the load (LOAD) and the power transistor switching stage (see capacitor C1 in Figure 2).

CLAIM 6

In accordance with claim 6, which depends from claim 8, the output voltage of the power transistor switching stage (Q1/Q2) is DC (see page 3, line 21).

CLAIM 7

In accordance with claim 7, which depends from claim 8, the output voltage of the power transistor switching stage (Q1/Q2) is AC (see page 3, line 25).

CLAIM 9

In accordance with claim 9, which depends from claim 8, the power transistor switching stage (Q1/Q2) is a switch mode power supply converter (see claim 8 as filed).

CLAIM 10

In accordance with claim 10, which depends from claim 8, the active EMI filter comprises a current transformer (CT) having first and second primary windings (CT1 and CT2) and first and second secondary windings (CT3 and CT4), the first primary winding (CT1) being connected between the first input terminal (A) and the first output terminal (OUT 1) and the second primary winding (CT2) being connected between the second input terminal (B) and the second output terminal (OUT 2) (see page 4, lines 12-25).

CLAIM 11

In accordance with claim 11, which depends from claim 10, a load (LOAD) is connected to the first and second output terminals (OUT 1 and OUT 2) and the ground (GND), wherein when a common mode noise current flows between the load (LOAD) and the ground (GND), a common mode current flowing between the input and output terminals (A/B and OUT 1/OUT 2) will flow in the first and second primary windings (CT1 and CT2) and a differential mode current is canceled, the common mode current being reflected additively in the secondary

winding (CT3 and CT4) and a normal mode current being canceled by polarization of the first and second primary windings (CT1 and CT2) (see page 4, lines 12-25).

CLAIM 12

In accordance with claim 12, which depends from claim 11, wherein the active EMI filter comprises two complementary PNP and NPN transistors (Q1 and Q2), only one of the transistors being conductive depending upon a direction of a current in the secondary winding (CT3 and CT4); and an isolating capacitor (C1) (see page 4, lines 24-28).

CLAIM 13

In accordance with claim 13, which depends from claim 12, wherein one of the two transistors (Q1 and Q2) is turned ON to allow a current generated in one of the secondary winding (CT3 and CT4) to flow through the isolating capacitor (C1) to cancel a ground noise current flowing in the ground line, thereby canceling the ground noise current flowing back to the input (A/B), the transistors (Q1 and Q2) being turned ON depending on a flow of the common mode current (see page 4, lines 24-28).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL:

The following grounds of rejection are presented for review:

A. Rejection under 35 U.S.C. §103(a)

Claims 3-6 and 8-13 have been rejected under 35 U.S.C. §103(a) as being anticipated by U.S. Patent No. 6,636,107 to Pelly ("Pelly '107") in view of U.S. Patent No. 6,700,806 to Kolar ("Kolar").

B. Rejection under 35 U.S.C. §103(a)

Claims 7-8 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,690,230 to Pelly ("Pelly '230") in view of U.S. Patent No. 5,731,689 to Sato ("Sato").

C. **Rejection under 35 U.S.C. §103(a)**

Claim 2 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Pelly '230 in view of Sato in further view of U.S. Patent No. 6,067,243 to Suzuki et al.

D. **Rejection under 35 U.S.C. §103(a)**

Claim 2 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Pelly '107 in view of Kolar in further view of U.S. Patent No. 5,668,464 to Ohkawa et al. ("Ohkawa").

ARGUMENT:

A. **Rejection under 35 U.S.C. §103(a)**

Claims 3-6 and 8-13 should not be rejected under 35 U.S.C. §103(a) as being anticipated by U.S. Patent No. 6,636,107 to Pelly ("Pelly '107") in view of U.S. Patent No. 6,700,806 to Kolar ("Kolar").

Independent claim 8 is directed to a circuit arrangement, which comprises a power transistor switching stage that provides an output voltage. As recited in claim 8, the power transistor switching stage "is a switch mode power supply." Switching mode power supplies switch a transistor between full saturation and full cutoff at a high rate, resulting in a rectangular waveform. Further, the circuit arrangement is recited to include "an active EMI filter having first and second input terminals ... connected to receive the output voltage of the power transistor switching stage"

Pelly '107 discloses a full diode bridge 40, which is not analogous to the claimed power transistor switching stage. There is no teaching or suggestion of a power transistor switching stage in Pelly comprising a switch mode power supply connected to supply its output to the active EMI filter. Nothing in the prior art teaches or suggests providing the active EMI filter at the output of the power transistor switching stage. The rectifier 40 of Pelly is merely a conventional passive rectifier bridge and not a power transistor switching stage as claimed. There is no suggestion in Pelly to place the power transistor switching stage there. In fact, Pelly only shows the power transistor switching stage (inverter 41) connected to the output of the EMI filter (170, 200)

The Examiner references Kolar as teaching control of voltage conversion to those skilled in the art. Kolar describes converting a three-phase voltage system to DC power. Kolar fails to

teach an active EMI filter "connected to receive the output voltage of the power transistor switching stage." There is no suggestion or description in Kolar of a switching power supply placed ahead of an active EMI filter as in claim 8.

To establish a prima facie case of obviousness, there must be "some suggestion or motivation ... to modify the reference" and there must be "a reasonable expectation of success." (see MPEP 2142) The Examiner has not explained what would be the motivation of those skilled in the art to substitute the full bridge of Pelly '107 with the power transistors of three-phase voltage boost converter system of Kolar. The outcome of such substitution is unforeseen and there is no reasonable expectation of success, i.e., " substantially eliminating any current due to the common mode current in the ground return line connected to the ground return line terminal" as recited in claim 8.

Thus, Pelly '107 and Kolar do not render independent claim 8 and claims 3-6 and 9-13, which depend from claim 8, obvious.

B. Rejection under 35 U.S.C. §103(a)

Claims 7-8 should not be rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,690,230 to Pelly ("Pelly '230") in view of U.S. Patent No. 5,731,689 to Sato ("Sato").

Pelly '230 describes a circuit having a full bridge rectifier circuit followed by a filter. Sato describes a circuit for providing voltage to three phases of a motor. No active EMI filter "connected to receive the output voltage of the power transistor switching stage" is taught or suggested by these references. There is no suggestion or description in Sato of a switching power supply placed ahead of an active EMI filter as in claim 8.

Similar to Kolar, the Examiner failed to explain the motivation of those skilled in the art to substitute the full bridge rectifier of Pelly '230 with the power transistors providing voltage to three-phases of a motor of Sato. The outcome of such substitution is unforeseen and there is no reasonable expectation of success, i.e., " substantially eliminating any current due to the common mode current in the ground return line connected to the ground return line terminal" as recited in claim 8.

Thus, Pelly '230 and Sato do not render independent claim 8 and claim 7, which depends from claim 8, obvious.

C. Rejection under 35 U.S.C. §103(a)

Claim 2 should not be rejected under 35 U.S.C. §103(a) as being unpatentable over Pelly '230 in view of Sato in further view of U.S. Patent No. 6,067,243 to Suzuki et al.

Suzuki does not remedy the failure of Pelly '230 and Sato to render independent claim 8 obvious. Therefore, claim 2 is not obvious for the same reasons discussed above in Argument section B.

D. Rejection under 35 U.S.C. §103(a)

Claim 2 should not be rejected under 35 U.S.C. §103(a) as being unpatentable over Pelly '107 in view of Kolar in further view of U.S. Patent No. 5,668,464 to Ohkawa et al. ("Ohkawa").

Ohkawa does not remedy the failure of Pelly '107 and Kolar to render independent claim 8 obvious. Therefore, claim 2 is not obvious for the same reasons discussed above in Argument section A.

CONCLUSION:

Pelly '107 and Pelly '230 do not teach, disclose, or suggest the power transistor switching stage placed ahead of the active EMI filter. Kolar and Sato do not teach cancellation of common mode current achieved by "an active EMI filter having first and second input terminals ... connected to receive the output voltage of the power transistor switching stage" as recited in claim 8. There is no motivation for those skilled in the art to combine Pelly '107 and Kolar and Pelly '230 and Sato.

Therefore, Pelly '107 and Kolar and Pelly '230 and Sato do not render independent claim 8 obvious.

Suzuki and Ohkawa have not been used by the Examiner to reject independent claim 8.

Claims 2-7 and 9-13 depend directly or indirectly from independent claim 8 and are, therefore, allowable for the same reasons, as well as because of the combination of features in those claims with the features set forth in the respective independent claims.

For the reasons set forth above, it is respectfully submitted that all rejections to the claims in this application have been addressed to clearly define over the prior art. Therefore, the Examiner is respectfully requested to reconsider the application and allow the case to issue.

Applicant reserves the right to request an oral hearing upon receipt of the Examiner's Answer.

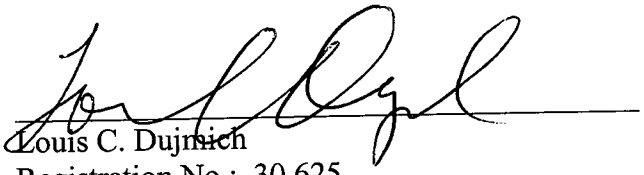
Credit card payment for the required filing fee in the amount of $510 (large entity) is submitted via EFS-WEB.

In the event the actual fee is greater than the payment submitted or is inadvertently not enclosed or if any additional fee during the prosecution of this application is not paid, the Patent Office is authorized to charge the underpayment to Deposit Account No. 15-0700.

In view of the above, it is submitted that all claims in this application are now in condition for allowance, prompt notification of which is requested.

THIS CORRESPONDENCE IS BEING SUBMITTED ELECTRONICALLY THROUGH THE PATENT AND TRADEMARK OFFICE EFS FILING SYSTEM ON May 20, 2008.

Respectfully submitted,



Louis C. Dujmich
Registration No.: 30,625
OSTROLENK, FABER, GERB & SOFFEN, LLP
1180 Avenue of the Americas
New York, New York 10036-8403
Telephone: (212) 382-0700

LCD:JK:ck

CLAIMS APPENDIX

Claim 1 (canceled).

2. The circuit arrangement of claim 8, wherein the power transistor switching stage comprises an output stage comprising an inductor and a capacitor with the output voltage provided across the capacitor.

3. The circuit arrangement of claim 8, wherein the active EMI filter comprises an amplifier stage having two transistors each controlled by a current sensor, the current sensor sensing the presence of a common mode current to a load connected to the active EMI filter,

each of said two transistors having a first terminal coupled at a common connection to an isolating capacitor coupled to a ground line, the isolating capacitor passing a current to cancel the common mode current in said ground line,

each of said two transistors further having a second terminal coupled to a control terminal via a secondary winding.

4. The circuit arrangement of claim 3, wherein the two transistors are complementary.

5. The circuit arrangement of claim 3, wherein the ground line connects the load and the power transistor switching stage.

6. The circuit arrangement of claim 8, wherein the output voltage of the power transistor switching stage is DC.

7. The circuit arrangement of claim 8, wherein the output voltage of the power transistor switching stage is AC.

8. A circuit arrangement comprising

a power transistor switching stage providing an output voltage and

an active EMI filter having first and second input terminals and first and second output terminals and a ground return line connected to a ground return line terminal, the input terminals of the active EMI filter being connected to receive the output voltage of the power transistor switching stage and the output terminals of the active EMI filter providing a filtered output voltage,

wherein the power transistor switching stage is a switch mode power supply and the active EMI filter cancels common mode current that flows between the input terminals and the output terminals, substantially eliminating any current due to the common mode current in the ground return line connected to the ground return line terminal.

9. The circuit arrangement of claim 8, wherein the power transistor switching stage is a switch mode power supply converter.

10. The circuit arrangement of claim 8, wherein the active EMI filter comprises a current transformer having first and second primary windings and first and second secondary windings, the first primary winding being connected between the first input terminal and the first output terminal and the second primary winding being connected between the second input terminal and the second output terminal.

11. The circuit arrangement of claim 10, further comprising a load connected to the first and second output terminals and the ground, wherein when a common mode noise current flows between the load and the ground, a common mode current flowing between the input and output terminals will flow in the first and second primary windings and a differential mode current is canceled, the common mode current being reflected additively in the secondary winding and a normal mode current being canceled by polarization of the first and second primary windings.

12. The circuit arrangement of claim 11, wherein the active EMI filter comprises two complementary PNP and NPN transistors, only one of the transistors being conductive depending upon a direction of a current in the secondary winding; and an isolating capacitor.

13. The circuit arrangement of claim 12, wherein one of the two transistors is turned ON to allow a current generated in one of the secondary winding to flow through the isolating capacitor to cancel a ground noise current flowing in the ground line, thereby canceling the ground noise current flowing back to the input, the transistors being turned ON depending on a flow of the common mode current.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.